ally left it and fled to the neighboring towns. The Montreal papers contain whole columns of accounts of the "astonishing appearances," and it was conjectured that they were occasioned by eruptions of some neighboring volcano, and it was assured that during the darkness there were three shocks of an earthquake.

Smoky atmosphere.—Letters from Louisville, Ky., inform us that a great part of the woods between that place and Lexington, a distance of 74 miles, were in a blaze; and at Louisville the inhabitants had been nearly suffocated with smoke. * * * In North Carolina the smoky atmosphere was attributed to woods on fire in that State. The same in Canada.

From the Columbian Centinel of Wednesday, December 8, 1819, No. 3721, pp. 1, 3.

SOUTH CAROLINA, CHARLESTON, *November 25.*

Smoky atmosphere.—We have Bermuda papers of the 6th instant. They complain much of the smoky appearance and scent of their atmosphere, which some conjectured to have been occasioned by a great fire on the American Continent; and others, to be exhalations of the Gulph Stream.

PLANT LIFE AND RAINFALL.

The vegetation indigenous to any region having long since adapted itself to the climate of that locality, it follows that the occasional extremes of temperature, rainfall, drought, etc., that are injurious to indigenous vegetation must have some relation to the ability of the plant to adapt itself to the normal climate and its normal variability.

Thus, fifty-four years at San Francisco give an average annual rainfall of 22.74 inches; forty-one years at Salt Lake City give 17.47 inches; thirty years at Denver give 14.07 inches. The corresponding annual variability or the probable variation of any year from the mean is ±4.00, 4.50, and 5.00 inches, respectively. This probable variation indicates that the annual values vary so much that there is an even chance that any year at San Francisco will have a rainfall either between 26.74 and 18.74 inches, or beyond these limits. For Salt Lake City these figures become 21.97 and 12.97 inches; for Denver the figures are 9.07 and 19.07 inches. Of course, therefore, at San Francisco 18.83 inches would correspond to a dry year, but not necessarily to a drought destructive to indigenous plants, because delicate plants must long since have died out or have learned to adapt themselves to such average dry years, and a really destructive drought must be something still more severe. During the fifty-four calendar years of San Francisco records, there has been one year with the rainfall 11.37 inches, or 50 per cent of the average, and the general distribution of rainfall is shown in the following table:

TABLE 1.—*Precipitation by calendar years.*

Percentage of normal.	Precipitation, in inches.	Number of years.	
Wet years, above 100 per cent.	Over 22.74	22	
Dry years.... 100–90 per cent.	22.74–20.47	13	32
90–80 per cent.	20.47–18.19	7	
80–70 per cent.	18.19–15.92	5	
70–60 per cent.	15.92–13.65	5	
60–50 per cent.	13.65–11.37	1	
50– 0 per cent.	11.27– 0	1	
		54	

If we consider the valuable crop plants that have been introduced into California and whose prosperity depends upon the winter rainfall, namely, October to April, inclusive, then we must sum up the rainfall for the crop year, July–June, inclusive, rather than for the calendar year, January–December. Tables of this kind, given by Professor McAdie, show that the average annual rainfall is 22.74 inches, the same as before, but the frequency of dry years occurs as in Table 2.

Therefore, there have altogether been fewer dry seasons. Yet these show a greater number of severe droughts than are shown by the calendar years.

We must now further distinguish between a meteorological or climatological drought and an agricultural drought. Thus, Professor McAdie states that the year 1885, with a rainfall of 24.90 inches in the calendar year, but of 18.10 inches in the crop year, 1884–85, was an agricultural drought and that the wheat yield was the lowest in twenty years. Again, the year July, 1881–June, 1882, gave a seasonal rainfall of 16.14 and the next year July, 1882–June, 1883, gave a rainfall of 20.12 inches, and yet these were good wheat years. The moisture in the soil, the irrigation, and the area covered by wheat, is not ordinarily considered by the climatologist. He confines his studies to precipitation data, and speaks of dry and wet years without reference to agricultural statistics.

TABLE 2.—*Precipitation by crop years.*

Percentage of normal.	Precipitation, in inches.	Number of years.	
Wet years, above 100 per cent.		26	
Dry years.... 100–90 per cent	22.74–20.47	7	28
90–80 per cent.	20.47–18.19	9	
80–70 per cent.	18.19–15.92	6	
70–60 per cent.	15.92–13.65	1	
60–50 per cent.	13.65–11.37	1	
50– 0 per cent.	11.37– 0	4	
		54	

OCEAN WAVE AT HONOLULU, HAWAII.

Rev. Dr. Sereno E. Bishop, well known as the first observer of Bishop's circle, writes from Honolulu under date of December 4, 1903:

On November 29 the self-recording tide gage in this harbor recorded several high and low tides in succession only a few minutes apart.

These are ocean waves, believed to be due to earthquakes, and to have traveled several thousand miles across the Pacific. Similar waves are known in former times to have come from Peru, from Japan, and from Krakatoa. The direction of the source of these last waves is determined by the fact that there were slightly damaging inundations along the north shore of the island of Oahu and also along the north shore of Molokai on the same day. Dr. Bishop therefore thinks it probable that these waves originated in the volcanic regions of the Aleutian Islands or of western Alaska. The seismograph at the United States magnetic station, some 20 miles from Honolulu, also recorded a very distinct convulsion of the earth at about the same time. Dr. Bishop adds that both Mauna Loa and Kilauea are now in great and increasing activity. These volcanoes are about 190 miles distant from Honolulu in a direct line, where their severest convulsions are only slightly felt, although once in many years their smoke slightly obscures the atmosphere at Honolulu. Kilauea is 25 miles east of Mauna Loa, and about 4000 feet high, while the latter is 14,000.

Is it not plausible that the oceanic wave reaching the northern coasts of the Hawaiian Islands originated in some slight disturbance at the bottom of the ocean near these islands, rather than in some greater disturbance on the Aleutian or Alaskan coasts?

LOWEST TEMPERATURE AT FRANKLINVILLE, N. Y.

Dr. John W. Kales, Voluntary Observer at Franklinville, N. Y., reports that on the morning of January 5 his thermometers and thermograph registered —34° at 6 a. m., being the lowest ever recorded at that station.

METEOR AT MARION, IND.

Mr. William T. Blythe, Section Director, Indianapolis, Ind., suggests that we put on record an observation of the great meteor, the largest and most brilliant ever witnessed in the neighborhood of Marion, Ind. It was seen on the morning of November 6, 1903, at exactly 20 minutes after 5 (we assume that this means 5 hours and 20 minutes central time, or 6 hours and 20 minutes Washington time, but we are not in-